AI for Children
Artificial Intelligence Curriculum for Elementary and Secondary Schools

Social Studies I

Recommendation Systems on Social Media

https://kurikulum.aidetem.cz/en

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We create methodologies in cooperation with the National Pedagogical Institute.

Form for comments

Recommendation Systems on Social Media

A few words to begin

Dear Teacher,

You are receiving a teacher material developed to support the teaching of artificial intelligence at the elementary and secondary school levels. This particular lesson focuses on recommendation systems – tools that use machine learning methods to suggest content on social media, streaming platforms, search engines, and more. The goal of the lesson is to help students understand how content is recommended to them in online environments, and to explore both the benefits and potential downsides of these systems. Thank you for your willingness and courage to teach your students about these important topics.

– AI for Children team

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20 min

Overview of the Topic

This lesson explores five models of social media platforms and how they work. We recommend reviewing the background materials we've prepared for you on the following pages.

Lesson presentation in PDF

Editable presentation in Canva

Lesson Overview

Recommended Age, Lesson Length
Children aged 13–18, 45 minutes.

Building Blocks
Social Media and Recommendation Systems.

What Are the Students Learning?
Recommendation systems track user behavior and use it to suggest content.
There are different models for how content is recommended on social media platforms.

Why Are They Learning This?
By understanding how recommendation systems work, they are able to critically evaluate the content suggested on social media.

How Do We Know They Have Learned It?
They describe different models of how recommendation systems work.

Tools
Teacher: Projection equipment and a presentation for display.
Students: Writing utensils, worksheet, and optionally a mobile phone with internet access.

Five Big Ideas
5-A-III Ethical AI (Practicing Ethical Design).
5-B-I AI & Culture (AI in Daily Life).
5-B-II AI & Culture (Trust and Responsibility).

Digital Competence
Facilitating Learners' Digital Competence.

Bloom's Taxonomy
Remembering: Students acquire basic concepts related to recommendation systems and their models on social media.
Applying: They apply their understanding of how these systems work to analyze the content they encounter on social media.
Creating: They develop arguments for and against recommendation systems, weighing their advantages and disadvantages based on the knowledge they have gained.

Note: Gender equality is key for AI for children, but for brevity we use masculine formulations in our methodologies.

Glossary of terms

Artificial Intelligence (AI)

There is no universally accepted definition of artificial intelligence. However, most descriptions agree that it refers to a system capable of simulating human thought and actions.

AI typically takes the form of a computer program designed to solve tasks that once required significant human intellect and were considered uniquely human.

AI is also a scientific field that emerged in the first half of the 20th century. It seeks not only to understand intelligent systems but primarily to create them.
nd intelligent systems, but especially to create them.

Recommendation Systems (RS)

(Recommendation systems are a type of machine learning technology. They are based on tracking user behavior, analyzing it, and then suggesting relevant content.

For example, if you watch a video of kittens on YouTube, the platform will likely suggest more similar videos.

Or, if the system notices that you (User A) behave similarly to User B – for instance, both of you watch videos with kittens and seals – it may recommend videos that User B enjoys, even if you haven't watched anything similar yet.

Recommendation systems analyze our behavior in two main ways. Let's take the example of rating a movie.

An explicit signal is when you rate the movie with stars.

An implicit signal is based on your actions – for example, whether you watched the movie to the end, or even watched it more than once.

Recommendation systems are widely used to suggest content on social media platforms, streaming services, and in search engines.

Machine Learning (ML)

Just like humans can learn from examples and experience, so can machines created by humans.

Machines learn using a method called machine learning, which allows AI systems to move beyond being just a collection of pre-programmed actions – they can come up with new solutions on their own.

The goal of machine learning methods is to identify patterns hidden in large volumes of data.

Big Data

Big data refers to large and diverse datasets in many different formats, varying in size and structure. These can include images, videos, audio recordings, texts, or so-called digital footprints – data about user behavior.
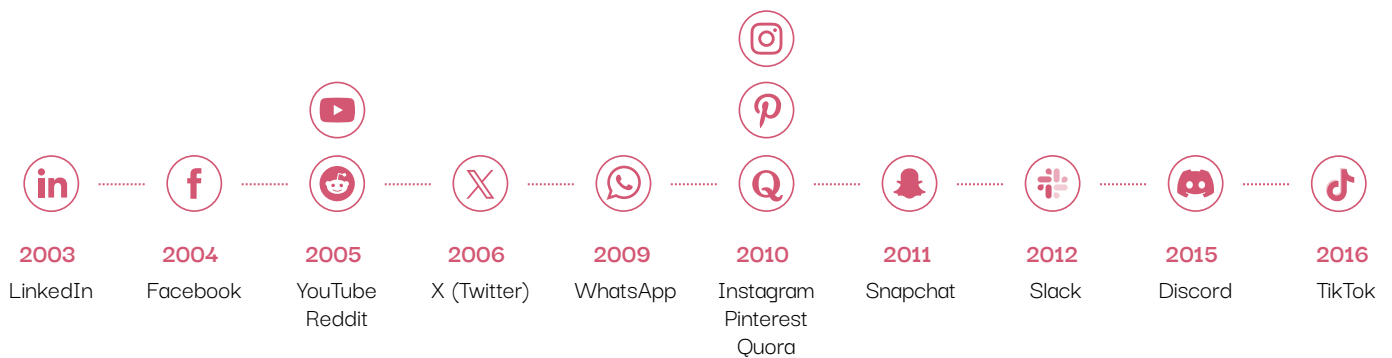
Big data has emerged as a result of the rapid growth of the internet, where much of the content is now created by users themselves.

Its rise is also driven by the development of IoT (Internet of Things) technologies, which can collect data from a wide range of sources.

Another factor is the significant drop in the cost of storing and processing data. There is typically so much data that traditional methods are no longer sufficient – modern approaches rely on using large numbers of computers and their storage capacities. This is also true for current machine learning techniques.
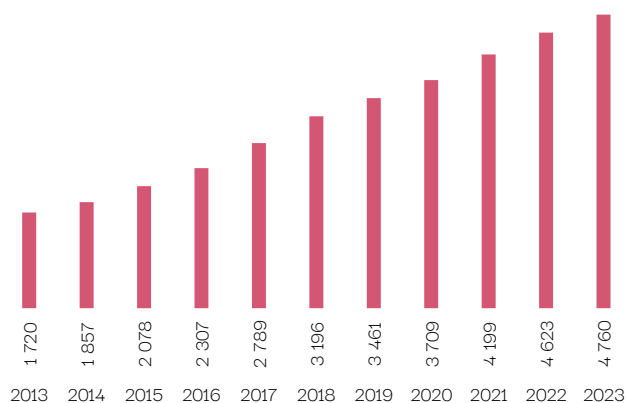
The internet and social media in numbers

If you'd like to share this data with your students, you can find it in the attached presentation on slides 02–04.

5,16 billion

Internet users worldwide in January 2023

out of nearly 8 billion people.

3 %

Year-over-year growth in internet users

compared to the number of users in 2022.

2,3 hours

Time spent on social media by the user

on average every day in January 2023.

4,76 billion

People actively using social media

(one or more) in January 2023.

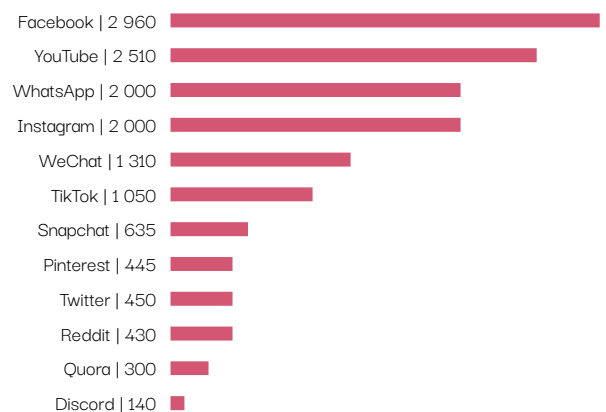| 2003	2004	2005	2006	2009	2010	2011	2012	2015	2016
LinkedIn	Facebook	YouTube Reddit	X (Twitter)	WhatsApp	Instagram Pinterest Quora	Snapchat	Slack	Discord	TikTok

Timeline of social media development

Only selected social media platforms are shown on the timeline – those relevant to the lesson at the time this teaching material was created.

Growth in social media users (in millions)

Year	Users
2013	1 720
2014	1 857
2015	2 078
2016	2 307
2017	2 789
2018	3 196
2019	3 461
2020	3 709
2021	4 199
2022	4 623
2023	4 760

Monthly active users on social media (in millions)

- Facebook | 2 960
- YouTube | 2 510
- WhatsApp | 2 000
- Instagram | 2 000
- WeChat | 1 310
- TikTok | 1 050
- Snapchat | 635
- Pinterest | 445
- Twitter | 450
- Reddit | 430
- Quora | 300
- Discord | 140

Source: www.ecommerce-nation.com

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Models of how social media platforms work

To help students better understand how content is recommended on social media, we've categorized recommendation systems into five functional models, each illustrated with two examples. It's important to note, however, that most platforms use a combination of these models and continuously adapt them over time.

Friend-Based Model
This is the oldest type of social network, adopted by platforms like Facebook and LinkedIn. Users connect with people they know – friends, colleagues, acquaintances.

Follower-Based Model
The second wave of social networks introduced the follower model. It solved the awkwardness of sending "friend requests" to people users didn't personally know but wanted to follow. However, this model also led to a concentration of content creation in the hands of a small number of influential users, making it harder for everyday users to be seen.

Interest-Based Model
These networks evolved from online forums into full-fledged social platforms, such as Reddit and Quora. Users choose specific topics they're interested in and join communities that share those interests.

Group-Based Model
A shift from building audiences to forming communities led to the rise of platforms like Discord and Slack.

Algorithmic Recommendation Model
In this model, users consume content primarily from algorithm-driven feeds, without needing to follow or friend anyone. TikTok popularized this with its For You Page, but YouTube was actually the first major platform to implement this model successfully.

The text describing the five models of how social media platforms work is largely based on a post by entrepreneur Mikko Alasaarela, originally shared on LinkedIn.

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Engage

10 min

Recall & Share

Which social media platforms do you have accounts on?
Or which ones do you use regularly, and why? What do you find useful or fun about them?

Can you think of any other social media platforms? (presentation slide 03)
Choose one and try to say something about it.

Think, Pair, Share

How to do Think, Pair, Share:
Think: Students start by thinking about the topic individually.
Pair: They then pair up and discuss the topic together.
Share: After a short time, selected pairs share their thoughts with the whole class.

There's a huge amount of content on social media — so it has to be filtered. Can you think of some ways this filtering might work for the user?
Possible answers: In my feed (timeline, wall…), I see posts from my friends; people I follow; based on my interests; depending on what group I'm in; what channel/server I follow; chosen by an algorithm based on likes (or other user behavior) and ads.

Different platforms recommend content in different ways. Every user sees something different — that's possible thanks to AI-powered recommendation systems. These systems track what we do on social media (this is called user behavior) and use it to pick content for us. What exactly do they track?

Answers:
– When and how often users access the platform.
– Which posts and profiles they view and how they interact with them (likes, comments, etc.).
– How long they spend watching or reading content.
– What topics interest them most and what activities they enjoy on the platform.
– What information they share in their profile or posts (e.g. age, gender, location…).
– How they use different features of the platform (e.g. sharing files, playing games, etc.).

Argue

Students write down the pros and cons on a sheet of paper. Return to it at the end of the lesson and reconsider if needed.

What are the pros and cons of content recommendation systems? Do you see any risks they might bring?
Pros: Recommendation systems are designed to help users find interesting content or products based on what they've interacted with in the past.

Cons: Recommendation systems can create so-called "filter bubbles" or "echo chambers," where users are only exposed to content that matches their previous preferences. This limits their chance to encounter new or different opinions and information. It can lead to a narrower perspective and reduce the ability to understand complex or diverse viewpoints.

Risks: Recommendation systems can be used to manipulate or influence user behavior and opinions in unethical ways.
Mental health impacts: Recommended content can increase addiction to social media, triggering negative emotions like low self-esteem, anxiety, or depression—especially when users compare themselves with the idealized lives and bodies they see online.
Fostering addiction: Social media algorithms are designed to keep users engaged as long as possible.
By recommending content that matches their interests, users may spend more time on the platform.
This can lead to time-consuming and unhealthy use of social media—resulting in social isolation and less time for entertainment in the real world.

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Understand

(30 min)

Activity 1 (10 min)
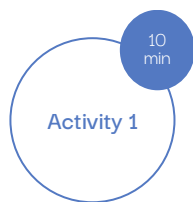
Students will get to know 5 models of how social networks work.
Students receive Worksheet 1 (if you prefer not to print it, a presentation will suffice), which contains brief descriptions of different models of social media. After completing the activity, students should be able to describe how 5 types of social media function and match some existing platforms to these models.

Worksheet 1
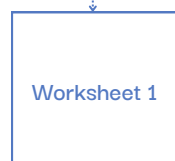
Students can work in groups. First, they read the short descriptions of the models and then connect (optionally by drawing) specific social media platforms to the corresponding models. It's likely that some platforms will be unfamiliar to them, so group discussion is encouraged. They can also look up information online if needed.

The correct matching of platforms to models can be found in the teacher's guide on page 4 of this material.

Activity 2 (15 min)
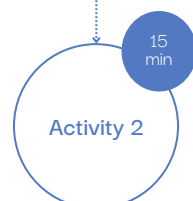
What TikTok knows about us.
Play students a 13-minute documentary by The Wall Street Journal about how TikTok's recommendation system works. TikTok uses an algorithmic recommendation model. Up to 95% of the content in a user's feed is recommended based purely on user behavior.
The Wall Street Journal created dozens of automated accounts with pre-set interests–accounts that TikTok had no prior knowledge of. Apart from watching the videos, these accounts didn't interact with content (e.g., by liking it). The algorithm, however, paid more attention to videos that aligned with the accounts' assigned interests and showed them repeatedly.
The experiment revealed that TikTok only needs to know how long a user watches certain types of content. Within just a few minutes, the platform can adjust what it shows you based on that.

Follow the video: www.youtube.com/watch?v=nfczi2cI6Cs (13:02)

Note: The video is from late 2021.

(5 min) Reflection on the video

TikTok first offers videos with a large reach, and then gradually adjusts the stream content based on user behavior. This is what makes TikTok so successful—the algorithm, powered by artificial intelligence, can predict what we want to see based on our activity and very quickly offer content we're likely to enjoy. This kind of recommended content makes up about 95% of the stream. At the beginning of this lesson, we talked about the pros and cons of recommended content. How do you see it now?

See page 05, section Engage.

What type of content do you consider potentially dangerous?

> Disinformation, i.e. false or misleading content that can influence public opinion or lead to poorly informed decisions.
> Content aimed at spreading hatred or discrimination against specific groups of people.
> Cyberbullying—targeted attacks on individuals or groups, including hate speech.
> Advice that promotes dangerous behavior or attitudes, such as harmful dieting or self-harm.

The video mentions so-called "Rabbit Holes." Can you explain what this term means?

In the context of social media, "Rabbit Holes" refer to the process in which a user gradually clicks on recommended links or content, often diving deeper and deeper into a specific topic or worldview. The algorithm keeps reinforcing this direction by suggesting similar content again and again.

Note: The video shows possible effects of TikTok's recommendation algorithm. However, recommendation algorithms work similarly across many different social media platforms.

Reflect

(5 min)

Describe & Compare

Which of the models of social media operation do you prefer or feel closest to? Give one reason why.
Optional: Which model do you find the least suitable, and why? Compare them.

Recall

Can you think of something you did that was directly inspired by something you saw on social media?
For example:
– In what ways do you let yourself be influenced by online content?
– Is there anything you saw online that you disagreed with?
– Do you think the time spent on social media affects how we perceive the world?
– If someone hypothetically spent more time on social media than with people in real life, how might their view of the world be shaped?

Where else can you come across recommendation systems?
Answers: Netflix, Spotify, Google Search, Rohlík, Amazon...

Apply

Do you have a TikTok account or use any other social media?
You can observe or even track for a while what kind of content is being offered to you.
Students can observe, for example, the ratio of content shared by friends or content their friends interacted with, content recommended based on their behavior, sponsored posts, content based on interests, and more...

More to explore

15 min

Activity 3

Somekone

If you have extra time, you can try a simulation of recommendation based on user interests with your students.
Use the application Somekone. You can find it here: somekone.gen-ai.fi/dashboard

Project the presentation from page 11 and click on the link. A dashboard for the Somekone app will appear along with a QR code. Students can scan the QR code on their devices (e.g., mobile phones connected to the internet). Once they open the link, they'll enter a nickname and a name (the actual name doesn't matter), and the simulation of social media will begin. Once all students are connected, click the START button on the dashboard. Students will then rate images (like, comment, or skip), and in real time, they'll be able to see how their reactions bring them closer to or further from other users based on shared interests. The closer users are to each other on the map, the more similar their interests are.
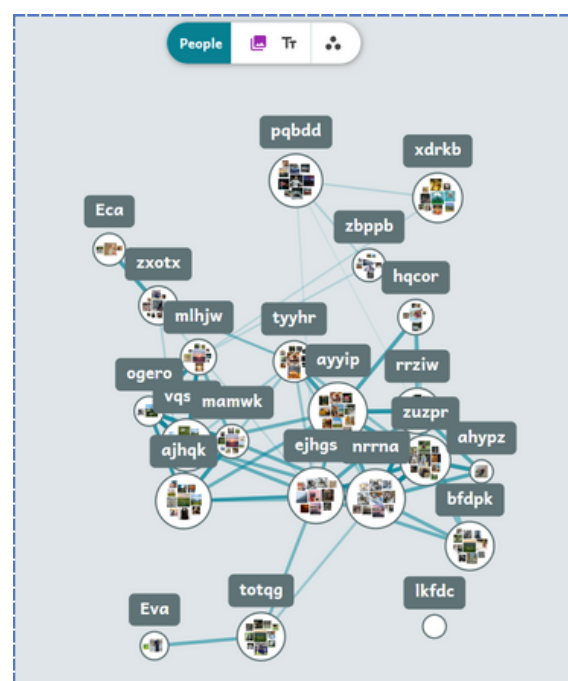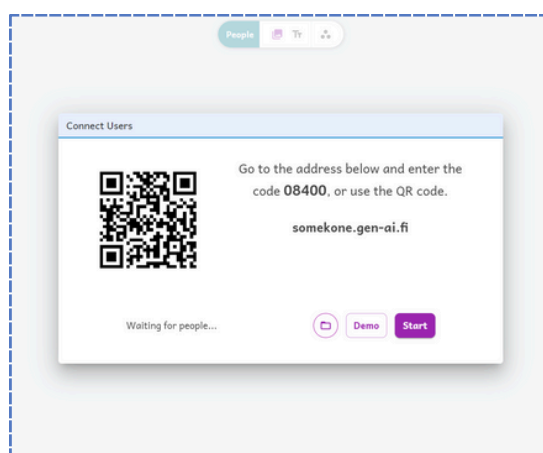
Social media operation models

Recommendation systems using artificial intelligence monitor user behavior and the information users share about themselves and their interests. Based on this, they suggest content.
Each social media platform has its own main model of user interaction. Currently, five models are commonly recognized.
Read the descriptions below and match social media logos with the corresponding models (you can draw the logos into the empty circles). Discuss your ideas with classmates if you're unsure.

Friends-Based Model
The oldest model of social media, where users follow their friends and acquaintances.

Followers-Based Model
The second wave of social media introduced the "followers" model. It solved the awkwardness of initiating "friendships" by allowing users to follow others without knowing them personally. However, this model also shifted focus toward content creation by a small number of the most influential individuals, making it harder for regular users to gain visibility.

Interest-Based Model
Originally found in online forums, this model evolved into full-fledged social networks. Users choose topics they want to explore and join groups with others who share the same interests.

Group-Based Model
A strong trend emerged in building communities, which gave rise to platforms that are often not even recognized as social networks—though they are.

Algorithmic Recommendation Model
Users consume content selected by an algorithmic feed, without needing to follow or friend anyone. Algorithmic recommendation is a direct response to user behavior.

Instagram	Reddit	Quora	Slack	X (Twitter)
LinkedIn	TikTok	Discord	YouTube	Facebook